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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

January 13, 1971

DD/ST# 145-71

OFFICE OF THE ADMINISTRATOR

Mr. Carl E. Duckett
Deputy Director
Science and Technology
Central Intelligence Agency
Washington, D. C. 20505

Dear Carl:

The attached letter is forwarded for your information. In addition to Mr. George P. Shultz, Director of Management and Budget, to whom the letter is addressed, this information has been forwarded to Dr. Henry A. Kissinger, Assistant to the President for National Security Affairs; Mr. William Anders, Executive Secretary of the National Aeronautics and Space Council; Dr. Edward E. David, Science Advisor Designate to the President; Mr. Frank M. Chapin, Senior Staff Member of the National Security Council and Dr. Robert Naka, Deputy Under Secretary of the Air Force (Space Systems).

If you have need for further information, we would be happy to supply it.

Sincerely,

Jacob E. Smart
Assistant Administrator for
DOD and Interagency Affairs

Enclosure:
Cy 8Jan71 ltr to Shultz from Low
with Enclosure (Position Paper)

OSD REVIEW COMPLETED

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

DD/ST# 145-701

OFFICE OF THE ADMINISTRATOR

JAN - 8 1971

Honorable George P. Shultz
Director
Office of Management and Budget
Washington, D. C. 20503

Dear Mr. Shultz:

The enclosed position paper, forwarded for your information, outlines the rationale and approach NASA has developed leading to the acquisition of two U-2 aircraft for use in the earth resources survey program. We plan to make this decision public as part of the FY 1972 NASA budget press conference, currently scheduled for the week of January 25, 1971. We have been working closely with the Air Force, the Central Intelligence Agency, and the elements of the Departments of Agriculture, Commerce, and Interior that have interests in environmental remote sensing; these are in agreement with our approach. We feel we have properly balanced the needs of the program against any potentially negative implications that might arise from NASA's involvement with this particular aircraft. We have taken care to assure that the equipment and operations will be completely unclassified and under NASA's direct control; we feel that the proper separation of the NASA research program from military and intelligence programs will avoid the possible question of NASA involvement in classified activities.

If there are any questions relative to this aspect of the NASA program, my staff and I are prepared to discuss them at your convenience. I am sending this same information to Dr. Henry A. Kissinger, Dr. Edward E. David, and Mr. William A. Anders.

Sincerely,

George M. Low

George M. Low
Acting Administrator

Enclosure

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POSITION PAPER

The National Aeronautics and Space Administration has been investigating in depth the application of remote sensing techniques from aircraft and spacecraft to meeting the growing needs of the nation in the surveying of our earth's resources. As part of its overall program, NASA is developing an Earth Resources Technology Satellite (ERTS) for first flight in 1972. This satellite will observe the earth from orbit and return continuous telemetered images of the earth and oceans to ground stations. The objectives of this experimental application of space technology are to determine what the values of repetitive, synoptic multi-spectral imagery are to the many earth disciplines, including geology, agriculture, hydrology, oceanography, geography, cartography, and to the related fields of environmental, ecological, and natural resources management.

Somewhat later, the first experimental manned space station, Skylab, will provide additional opportunities for a wide variety of earth observations with different and more sophisticated sensors.

The data acquired by these two space missions are expected to be of great interest and value to the many participants with NASA in the earth resources survey program; these include major elements of the Departments of Agriculture, Commerce, and Interior as well as university scientists and regional, state, and local environmental and resource management institutions.

In order to prepare this large community of potential users of space data for the time when ERTS and Skylab are operating, and to determine the proper role for aircraft, as well as spacecraft, NASA has an ongoing aircraft program acquiring data over a broad range of test sites. NASA is augmenting this activity in order to provide precursory data that simulate as closely as possible the spectral content, scale, and time intervals between repetitive coverage that are expected from the satellite. This simulation, using high

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altitude aircraft, is planned over three U. S. regions where intensive studies in environmental remote sensing are already underway and where ground truth is well documented: California, Arizona, and the Chesapeake Bay.

The aircraft selected for this program must be capable of very high altitude sustained flight in order to permit the sensors to provide space-like data. In conjunction with the Air Force, NASA has selected the U-2 as the most economical and efficient experimental platform for this program.

Two U-2 aircraft currently surplus to Defense Department needs will be loaned or transferred to NASA for this program within the next several months and will join NASA's existing complement of earth resources survey aircraft. The two U-2's will be stationed at and managed by NASA's Ames Research Center, Moffett Field, California. The aircraft will be totally dedicated to NASA activities and under NASA's operational control at all times; there will be no other missions assigned to these planes. Pilots and ground crews will be provided for by contract with the Lockheed Aircraft Company, the original designers and builders of the U-2. Pilots will be former Air Force officers fully qualified and experienced in U-2 flight operations.

The aircraft system, performance, and capabilities, together with the NASA sensor packages and the data therefrom, will be completely unclassified, and the program will be carried out openly and publicly. A draft press release, proposed for issuance after completion of NASA's arrangements with the Air Force, is attached for information.

In addition to their primary role in the earth resources survey simulation, the U-2 will be able to serve as excellent high-altitude platforms for astronomical and geophysical experiments, supplementing NASA's present CV-990 research aircraft.

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Because of the prior history of the U-2, NASA has taken this step only after a very careful assessment of the alternatives and after assuring itself that it could do so without constraints. It can be stated without reservation that NASA will acquire and operate these aircraft for its own programmatic research and development mission alone, and that there are no national security implications involved. NASA will use the U-2 because it is the most economical high-altitude airborne platform available; it is the same philosophy that controls NASA's present use of a modified reconnaissance version of the B57 bomber for research in earth survey sensors.

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DRAFT PRESS RELEASE ATTACHMENT 1

The National Aeronautics and Space Administration is intensifying its Airborne Research Program by acquiring additional aircraft and concentrating flights over four ecological test areas in the United States.

The objectives are:

- to simulate over the four sites as closely as possible the data output of the Earth Resources Technology Satellite (ERTS) scheduled for launch in 1972,
- to collect data over various test sites simultaneous with passes of the ERTS satellites and Skylab after they are orbited,
- and to conduct observations in astronomy, atmospheric physics and geophysics for NASA's Physics and Astronomy programs.

To implement the program, NASA has signed a Memorandum of Understanding with the U. S. Air Force to add two surplus aircraft to NASA's Airborne Research Program.

The planes, U-2Cs declared surplus by the Air Force, are capable of several hours of flight at 70,000 feet, providing an ideal platform for photography of large areas of the U. S. for Earth resources studies.

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From that altitude, cameras can observe as much as 500 square miles of the Earth's surface in a single photograph.

When both aircraft become operational in June 1971, their primary assignment will be to obtain Earth resources data over the four multidisciplinary sites. The data they gather will simulate scale, spectral content, and the repetitive coverage of the ERTS satellites. This will give users a year's time in advance of the ERTS launch to gain experience with data similar to ERTS data.

The aircraft will make flights at 68,000 feet over the test sites and simulate the satellite coverage at 18 days at about 10:00 a.m. local time.

The test sites are:

- Arizona site east of Phoenix, arid lands,
- two California sites, Feather River and Monterey/ Los Angeles area, hydrology and agriculture,
- Chesapeake Bay, ecology and oceanography.

Instruments to be flown by the aircraft will gather data to simulate that from two ERTS instruments, the Return Beam Vidicon (RBV) and the Multispectral Scanner (MSS).

The two U-2 aircraft complement three other planes, stationed at the Manned Spacecraft Center, Houston, Texas, in NASA's Earth resources aircraft program. These planes are the P3A, a modified Electra; a C-130B Hercules; and an RB-57F.

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The U-2s will be permanently based at NASA's Ames Research Center, Mountain View, California. For flights over the eastern United States, they will be staged either from NASA's Wallops Station, Virginia, or from Langley Research Center, Hampton, Virginia. They will be flown by civilian pilots from the Lockheed Aircraft Corporation.

They will be painted blue and white and will be named "NASA Earth Survey Aircraft 4" and "NASA Earth Survey Aircraft 5."

Later in 1971, the U-2s will be used for conducting observations in astronomy, atmospheric physics and geophysics. At 70,000 feet, the planes will fly telescopes above about 95% of the Earth's atmosphere to make observations in the infrared, ultraviolet and visible portions of the electromagnetic spectrum.

An "Announcement of Flight Opportunity" will be issued by NASA later next year inviting scientists to participate in the astronomy flight program.

The Airborne Research Program will be managed by NASA's Office of Space Science and Applications and project management will be by the Ames Research Center.

The Goddard Space Flight Center, which manages the ERTS project will advise on how to make the aircraft data simulate ERTS data as nearly as possible.

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The cost of acquiring and operating the two U-2 aircraft for the first full year is estimated at about $1 million. It is estimated that each plane will fly some 600 hours per year.

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